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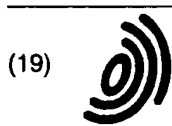
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(54) **Pedal arrangement in a vehicle cab**

(57) Pedal arrangement in a vehicle cab, comprising a support (5) fixed in the cab, in which a pedal arm (2) is mounted for pivoting about a pivot axis (4) spaced from both ends (2a, 2b) of the pedal arm. At its upper

end, the pedal arm is joined to one end of a flexible rod (12), e.g. a steel cable, which can transmit tensile force to an operating lever (11), but which bends if subjected to compressive force.

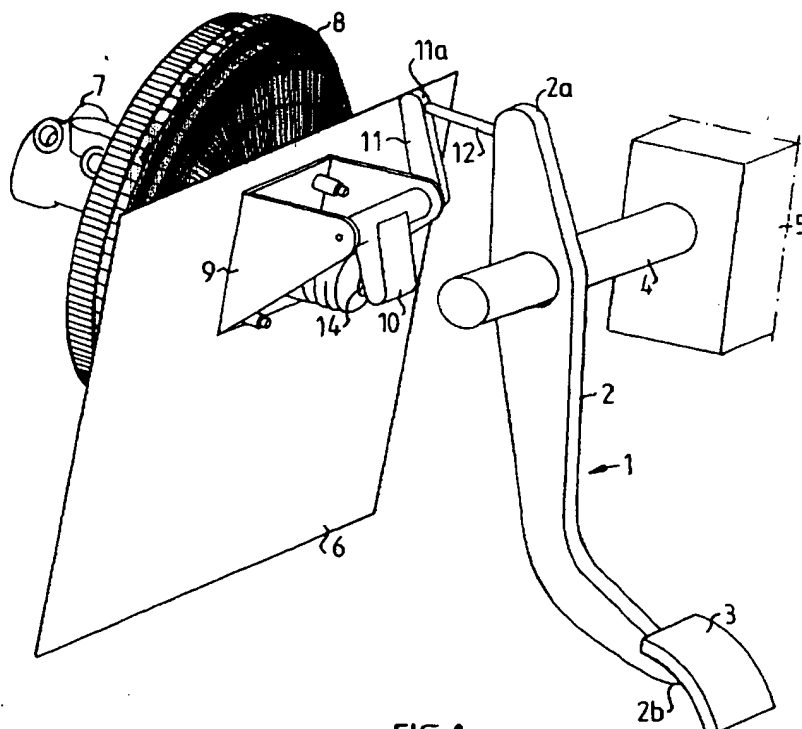


FIG. 1

Description

[0001] The present invention relates to a pedal arrangement in a vehicle cab, comprising: a support fixed in the cab; at least one pedal arm, which is journaled in the support for pivoting about a pivot axis spaced from the two ends of the pedal arm; a foot plate fixed to a portion of the pedal arm on one side of the pivot axis; a motion-transmitting element, which is joined firstly to the portion of the pedal arm on the other side of the pivot axis, and secondly to a pivotally mounted lever, which when pivoting actuates an operating device, which is fixed to an element spaced from the support.

[0002] The operating device can be, for example, a brake servo unit which is fixed to the outside of an intermediate wall between the cab and the engine compartment, and which has a push rod which extends through the intermediate wall. The pedal arm is usually journaled at its upper end and acts with its portion below the journal on a push rod for braking. This means that in a collision with the intermediate wall pressed into the cab, the servo unit with its push rod will pivot the pedal arm upwards, often resulting in major injury to the feet and shins.

[0003] In order to avoid the pedal arm being pivoted upwards in this manner if the servo unit is displaced in towards the cab, it is previously known by SE 9800420, for example, to journal the pedal arm at a point remote from its upper end and to pivotally join the upper end of the pedal arm to one end of a rigid motion-transmitting rod, the other end of which is pivotally joined to one end of a pivotally mounted lever which, when pivoted, actuates the push rod of the servo unit. In a collision causing the servo unit to be pressed in towards the cab, the pedal arm now instead will be pivoted down towards the cab floor. Even though this design can reduce the risk of injury to the shins of the driver, it can cause other serious injury instead if the driver's foot happens to be directly under the pedal at the moment of collision, and is clamped between the pedal and the cab floor. This is especially serious if the driver should be held fast so that he cannot rapidly leave the vehicle, in the event of a fire.

[0004] The purpose of the present invention is, starting from the pedal arrangement disclosed by way of introduction, to achieve a pedal arrangement which eliminates the risk of a foot being clamped fast between the underside of the pedal and the floor of the vehicle cab in a collision, resulting in displacement of a brake servo unit, for example, in towards the cab.

[0005] This is achieved according to the invention by virtue of the fact that the motion-transmitting element is disposed so that the distance between its attachment points to the respective arms is maintained at least substantially constant when there is a tensile force on the element, but is allowed to be shortened when there is compressive force. In a preferred embodiment, the motion-transmitting element is a metal cable, which can transmit tensile force, e.g. from a brake pedal in normal

braking, but will bend when subjected to compressive force, so that it cannot press down the pedal and clamp anything if its associated servo unit is pushed in towards the vehicle cab in a collision.

5 [0006] The pedal arrangement shown and described in the above mentioned SE 9800420 has no less than five pivot points between the pedal arm and the push rod of the servo unit. Each pivot point is a potential source of play, at least after a certain amount of use, and the more pivot points there are, the greater will be the total play. By using a flexible cable, at least one pivot point, and in certain cases two pivot points, can be eliminated by rigidly attaching the ends of the wires to the respective arm, e.g. by welding. In this manner, the play in the system is reduced. An additional advantage with a cable is that greater tolerances can be permitted without sacrificing function.

10 [0007] The invention will be described below in more detail with reference to examples shown in the accompanying drawings, where Fig. 1 shows a schematic representation of a first embodiment of a pedal arrangement according to the invention, and Fig. 2 shows a corresponding schematic representation of a second embodiment of a pedal arrangement according to the invention.

15 [0008] In the figures, 1 designates a brake pedal which consists of a pedal arm 2 and a foot plate 3. At a point between its upper and lower ends 2a and 2b respectively, the pedal arm 2 is pivotally mounted on a shaft 4, which is fixed to a support element 5, constituting a portion of the body structure of the vehicle spaced from its cowl wall 6, i.e. the wall separating the cab spaced from the engine compartment. On the side of the wall 6 facing the engine compartment, there is a main brake cylinder 7 with its servo unit 8. On the opposite side of the wall 6, there is fixed a bracket 9. A rocker arm 10 is journaled in the bracket 9 and is rigidly joined to a lever 11.

20 [0009] At the upper end 11a of the lever 11, a flexible rod 12 is rigidly fixed. The rod 12 can be a steel cable, which is welded fast to the lever 11. In the embodiment shown in Fig. 1, the rod 12 is also rigidly fixed to the upper end 2a of the pedal arm 2. If the distance is short between supporting element 5 and the wall 6, it can be necessary to pivotally join at least one end of the rod 12 relative to the associated arm, and in Fig. 2 such an alternative is shown where the rod 12 is pivotally joined to the upper end of the pedal arm 2 via a pivot pin 13.

25 [0010] The distal end portion of the rocker arm 10 is disposed directly in front of an end of an actuator rod 14, which extends through the wall 6 and into the servo unit 8. During normal braking, when the foot plate 3 is depressed so that the pedal arm 2 rotates clockwise, the lever 11 is also pivoted clockwise under the influence of the tensile force from the rod 12, whereupon the rocker arm 10 displaces the actuator rod towards the servo unit. If the vehicle should be involved in a head-on collision, resulting in displacement of the wall 6 with the

servo unit 8, so that the distance to the supporting element 5 is reduced, the rod 12 will be subjected to a compressive force, which strives to rotate the pedal arm in the same direction as for normal braking. The rod 12, which, as was mentioned above, can be a steel cable, is however dimensioned so that it only can transmit insignificant compressive force before it bends, which will mean that if there is a foot under the foot plate 3 at the moment of collision, there will be no risk of being clamped fast.

[0011] Within the scope of the invention it is also conceivable to have, instead of a flexible element such as a steel cable, a rigid telescoping element, which is pivotally joined to the respective arms at both ends. Both parts of the element can be pushed together when they are subjected to a compressive force. Here the advantages of the rigid fixation are lost, however.

Claims

1. Pedal arrangement in a vehicle cab, comprising: a support (5) fixed in the cab; at least one pedal arm (2), which is journaled in the support for pivoting about a pivot axis (4) spaced from the two ends (2a, 2b) of the pedal arm; a foot plate (3) fixed to a portion of the pedal arm on one side of the pivot axis; a motion-transmitting element (12), which is joined firstly to the portion of the pedal arm on the other side of the pivot axis, and secondly to a pivotally mounted lever (11), which when pivoting actuates an operating device (8), which is fixed to an element (6) spaced from the support, **characterized in that** the motion-transmitting element (12) is disposed so that the distance between its attachment points (2a, 11a) to the respective arms is maintained at least substantially constant when there is a tensile force on the element, but is allowed to be shortened when there is compressive force.
2. Pedal arrangement according to Claim 1, **characterized in that** the motion-transmitting element (12) is an elongated flexible element.
3. Pedal arrangement according to Claim 1 or 2, **characterized in that** the motion-transmitting element (12) is a metal cable.
4. Pedal arrangement according to one of Claims 1-3, **characterized in that** the motion-transmitting element (12) is rigidly fixed to at least either the pedal arm (2) or the lever (11) and is pivotally joined to the other of the two arms.
5. Pedal arrangement according to one of Claims 1-3, **characterized in that** the motion-transmitting element (12) is rigidly fixed both to the pedal arm and to the lever.
6. Pedal arrangement according to one of Claims 1-5, **characterized in that** the lever (11) is joined to a rocker arm (10), which, when the lever is pivoted, acts on an actuator rod (14) for a brake servo unit (8), which is located on the outside of an intermediate wall (6) on the inside of which the support is located spaced from the intermediate wall.

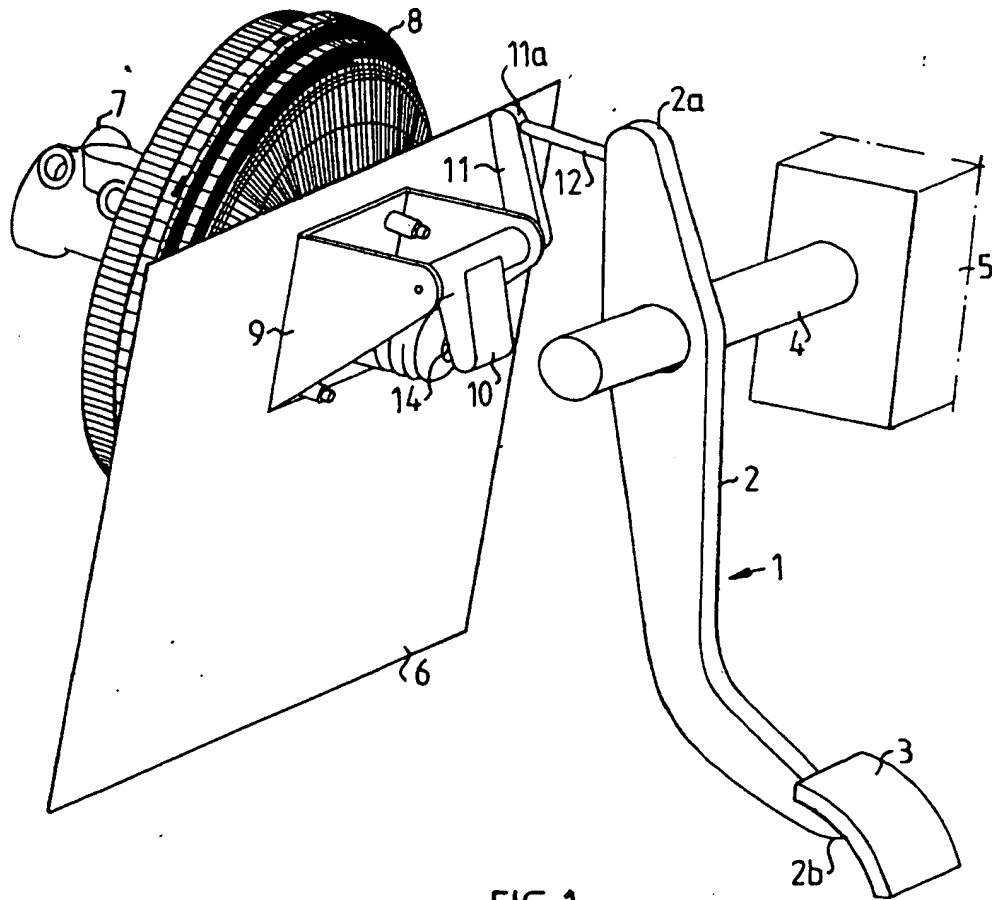
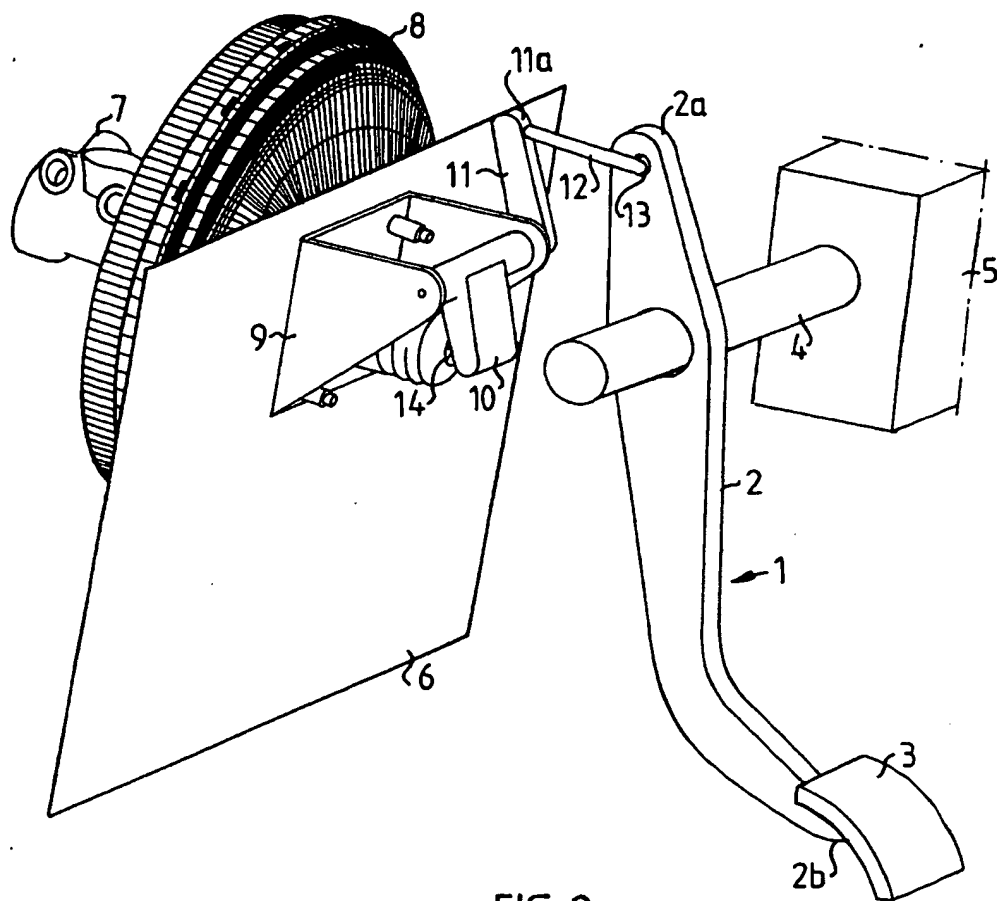


FIG. 1





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EUROPEAN SEARCH REPORT

Application Number
EP 01 85 0063

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 31 40 329 A (AUDI NSU AUTO UNION AG) 21 April 1983 (1983-04-21)	1-5	B60T7/06
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* page 1, right-hand column, line 17 - line 43; figures 1,2 *			
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 6 July 2001	Examiner Van Koten, G
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